

COMPRESSOR DEFINITION

| | |
|---------------------------|--------------------|
| Designation | EM 20HHR |
| Nominal Voltage/Frequency | 220-240 V 50-60 Hz |
| Engineering Number | 513307544 |

A - APPLICATION / LIMIT WORKING CONDITIONS

| | | | |
|------------------------------------|-----------------------------------|-----------------------------------|--------------|
| 1 Type | Hermetic reciprocating compressor | | |
| 2 Refrigerant | R-134a | | |
| 3 Nominal voltage and frequency | 220-240 / 50-60 | [V / Hz] | |
| 4 Application type | Low-Medium-High Back Pressure | | |
| 4.1 Evaporating temperature range | -35°C to 15°C | (-31°F to 59°F) | |
| 5 Motor type | RSIR/CSIR | | |
| 6 Starting torque | LST - Low Starting Torque | | |
| 7 Expansion device | Capillary tube | | |
| 8 Compressor cooling | | Operating voltage range | |
| | | 50 Hz | 60 Hz |
| 8.1 LBP (32°C Ambient temperature) | Static | 187 to 255 V | 187 to 242 V |
| 8.2 LBP (43°C Ambient temperature) | Static | 187 to 255 V | 187 to 242 V |
| 8.3 HBP (32°C Ambient temperature) | Fan | 187 to 255 V | 187 to 242 V |
| 8.4 HBP (43°C Ambient temperature) | Fan | 187 to 255 V | 187 to 242 V |
| 9 Maximum condensing temperature | | | |
| 9.1 Operating | 14.2 | [kgf/cm ²] (202 psig) | / °C - °F |
| 9.2 Peak | 15.9 | [kgf/cm ²] (226 psig) | / °C - °F |
| 10 Maximum winding temperature | 130 | [°C] | |

B - MECHANICAL DATA

| | | |
|-------------------------------|---------------|--|
| 1 Commercial designation | 1/12 | [hp] |
| 2 Displacement | 2.27 | [cm ³] (0.139 cu.in) |
| 2.1 Bore [mm] | 19.000 | |
| 2.2 Stroke [mm] | 8.000 | |
| 3 Lubricant charge | 160 | [ml] (5.41 fl.oz.) |
| 3.1 Lubricants approved | | |
| 3.2 Lubricants type/viscosity | ESTER / ISO22 | |
| 4 Weight (with oil charge) | 6.81 | [kg] (15.01 lb.) |
| 5 Nitrogen charge | 0.2 to 0.3 | [kgf/cm ²] (2.84 to 4.27 psig) |

C - ELETRICAL DATA

| | | |
|--|--|------------------------------------|
| 1 Nominal Voltage/Frequency/Number of Phases | 220-240 V 50-60 Hz 1 ~ (Single phase) | |
| 2 Starting device type | Current Relay | |
| 2.1 Starting device | 213514032/213515225 | |
| 3 Start capacitor | 72-88(150) | [µF(VAC minimum)] |
| 4 Run capacitor | - | [µF(VAC minimum)] |
| 5 Motor protection | 4TM189NFBYY-53 | |
| 6 Start winding resistance | 50.30 | [Ω at 25°C (77°F)] +/- 8% |
| 7 Run winding resistance | 31.80 | [Ω at 25°C (77°F)] +/- 8% |
| 8 LRA - Locked rotor amperage (50/60 Hz) | 6.50/6.00 | [A] - Measured according to UL 984 |
| 9 FLA - Full load amperage L/MBP (50/60 Hz) | 0.65/0.60 | [A] - Measured according to UL 984 |
| 10 FLA - Full Load Amperage HBP (50/60 Hz) | 0.75/0.70 | [A] - Measured according to UL 984 |
| 11 Approval boards certification | CCC - CE - IRAM - ISI - TUV - UKCA - VDE | |

D - PERFORMANCE - CHECK POINT DATA

| | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--------------------------------------|-------|
| TEST CONDITIONS: @220V50Hz | | | ASHRAEHBP32 Static | | Evaporating temperature (Condensing temperature) | | 7.2°C (44.96°F) 54.4°C (129.92°F) | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 840 | 212 | 246 | 98 | 0.62 | | 8.57 | 2.16 | 2.51 |

| | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--------------------------------------|-------|
| TEST CONDITIONS: @220V60Hz | | | ASHRAEHBP32 Static | | Evaporating temperature (Condensing temperature) | | 7.2°C (44.96°F) 54.4°C (129.92°F) | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 998 | 251 | 292 | 118 | 0.66 | | 8.46 | 2.13 | 2.48 |

| | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--------------------------------------|-------|
| TEST CONDITIONS: @220V60Hz | | | ASHRAEHBP32 Fan | | Evaporating temperature (Condensing temperature) | | 7.2°C (44.96°F) 54.4°C (129.92°F) | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 998 | 251 | 292 | 118 | 0.66 | | 8.46 | 2.13 | 2.48 |

| | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--|-------|
| TEST CONDITIONS: @220V50Hz | | | ASHRAELBP32 Static | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 172 | 43 | 50 | 59 | 0.50 | 0.98 | 2.92 | 0.74 | 0.86 |

| | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--|-------|
| TEST CONDITIONS: @220V60Hz | | | ASHRAELBP32 Static | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 200 | 50 | 59 | 66 | 0.65 | 1.14 | 3.03 | 0.76 | 0.89 |

| | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--|-------|
| TEST CONDITIONS: @220V60Hz | | | ASHRAELBP32 Fan | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 200 | 50 | 59 | 66 | 0.65 | 1.14 | 3.03 | 0.76 | 0.89 |

E - PERFORMANCE - CURVES

| TEST CONDITIONS: | | ASHRAE32 | | | (Condensing temperature 45°C (+113°F)) | | | | | |
|-------------------------|-------|------------------|----------|-----|--|---------------------|---------------|-----------------|-----------|-------|
| @220V50Hz | | Static | | | | | | | | |
| Evaporating temperature | | Cooling capacity | | | Power consumption | Current consumption | Gas flow rate | EFFICIENCY RATE | | |
| | | +/- 5% | | | +/- 5% | +/- 5% | +/- 5% | +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 78 | 20 | 23 | 48 | 0.48 | 0.44 | 1.66 | 0.42 | 0.49 |
| -30 | (-22) | 126 | 32 | 37 | 51 | 0.49 | 0.72 | 2.45 | 0.62 | 0.72 |
| -25 | (-13) | 182 | 46 | 53 | 56 | 0.50 | 1.04 | 3.20 | 0.81 | 0.94 |
| -20 | (- 4) | 248 | 62 | 73 | 62 | 0.51 | 1.41 | 3.94 | 0.99 | 1.16 |
| -15 | (+ 5) | 326 | 82 | 95 | 68 | 0.53 | 1.86 | 4.74 | 1.19 | 1.39 |
| -10 | (+14) | 417 | 105 | 122 | 74 | 0.54 | 2.39 | 5.63 | 1.42 | 1.65 |
| -5 | (+23) | 524 | 132 | 154 | 79 | 0.56 | 3.01 | 6.68 | 1.68 | 1.96 |
| 0 | (+32) | 650 | 164 | 190 | 83 | 0.57 | 3.76 | 7.92 | 2.00 | 2.32 |
| +5 | (+41) | 795 | 200 | 233 | 86 | 0.58 | 4.63 | 9.42 | 2.37 | 2.76 |
| +10 | (+50) | 963 | 243 | 282 | 87 | 0.60 | 5.64 | 11.22 | 2.83 | 3.29 |
| +15 | (+59) | 1154 | 291 | 338 | 86 | 0.61 | 6.82 | 13.37 | 3.37 | 3.92 |

| TEST CONDITIONS: | | ASHRAE32 | | | (Condensing temperature 55°C (+131°F)) | | | | | |
|-------------------------|-------|------------------|----------|-----|--|---------------------|---------------|-----------------|-----------|-------|
| @220V50Hz | | Static | | | | | | | | |
| Evaporating temperature | | Cooling capacity | | | Power consumption | Current consumption | Gas flow rate | EFFICIENCY RATE | | |
| | | +/- 5% | | | +/- 5% | +/- 5% | +/- 5% | +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 56 | 14 | 16 | 44 | 0.48 | 0.32 | 1.34 | 0.34 | 0.39 |
| -30 | (-22) | 94 | 24 | 28 | 49 | 0.49 | 0.54 | 2.00 | 0.50 | 0.59 |
| -25 | (-13) | 141 | 36 | 41 | 55 | 0.50 | 0.81 | 2.60 | 0.66 | 0.76 |
| -20 | (- 4) | 199 | 50 | 58 | 62 | 0.52 | 1.13 | 3.19 | 0.80 | 0.94 |
| -15 | (+ 5) | 269 | 68 | 79 | 69 | 0.53 | 1.53 | 3.82 | 0.96 | 1.12 |
| -10 | (+14) | 354 | 89 | 104 | 76 | 0.55 | 2.02 | 4.54 | 1.14 | 1.33 |
| -5 | (+23) | 456 | 115 | 133 | 83 | 0.57 | 2.62 | 5.40 | 1.36 | 1.58 |
| 0 | (+32) | 576 | 145 | 169 | 89 | 0.59 | 3.33 | 6.46 | 1.63 | 1.89 |
| +5 | (+41) | 717 | 181 | 210 | 93 | 0.61 | 4.18 | 7.75 | 1.95 | 2.27 |
| +10 | (+50) | 882 | 222 | 258 | 95 | 0.63 | 5.17 | 9.34 | 2.35 | 2.74 |
| +15 | (+59) | 1071 | 270 | 314 | 95 | 0.66 | 6.32 | 11.26 | 2.84 | 3.30 |

| TEST CONDITIONS: | | ASHRAE32 | | | (Condensing temperature 65°C (+149°F)) | | | | | |
|-------------------------|-------|------------------|----------|-----|--|---------------------|---------------|-----------------|-----------|-------|
| @220V50Hz | | Static | | | | | | | | |
| Evaporating temperature | | Cooling capacity | | | Power consumption | Current consumption | Gas flow rate | EFFICIENCY RATE | | |
| | | +/- 5% | | | +/- 5% | +/- 5% | +/- 5% | +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 34 | 9 | 10 | 43 | 0.48 | 0.19 | 0.73 | 0.18 | 0.21 |
| -30 | (-22) | 63 | 16 | 19 | 48 | 0.49 | 0.36 | 1.37 | 0.35 | 0.40 |
| -25 | (-13) | 102 | 26 | 30 | 55 | 0.50 | 0.58 | 1.95 | 0.49 | 0.57 |
| -20 | (- 4) | 152 | 38 | 44 | 62 | 0.51 | 0.86 | 2.50 | 0.63 | 0.73 |
| -15 | (+ 5) | 215 | 54 | 63 | 70 | 0.53 | 1.23 | 3.09 | 0.78 | 0.91 |
| -10 | (+14) | 294 | 74 | 86 | 78 | 0.55 | 1.68 | 3.75 | 0.95 | 1.10 |
| -5 | (+23) | 391 | 98 | 114 | 85 | 0.57 | 2.24 | 4.55 | 1.15 | 1.33 |
| 0 | (+32) | 507 | 128 | 148 | 91 | 0.59 | 2.93 | 5.53 | 1.39 | 1.62 |
| +5 | (+41) | 645 | 162 | 189 | 96 | 0.62 | 3.75 | 6.74 | 1.70 | 1.97 |
| +10 | (+50) | 806 | 203 | 236 | 99 | 0.64 | 4.72 | 8.23 | 2.07 | 2.41 |
| +15 | (+59) | 994 | 250 | 291 | 99 | 0.67 | 5.87 | 10.06 | 2.53 | 2.95 |

E - PERFORMANCE - CURVES

| TEST CONDITIONS: @220V60Hz | | ASHRAE32 Static | | | (Condensing temperature 45°C (+113°F)) | | | | | |
|-------------------------------|-------|----------------------------|----------|-----|--|-------------------------------|-------------------------|---------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 95 | 24 | 28 | 50 | 0.42 | 0.54 | 1.98 | 0.50 | 0.58 |
| -30 | (-22) | 157 | 40 | 46 | 58 | 0.44 | 0.89 | 2.63 | 0.66 | 0.77 |
| -25 | (-13) | 221 | 56 | 65 | 65 | 0.46 | 1.26 | 3.30 | 0.83 | 0.97 |
| -20 | (- 4) | 293 | 74 | 86 | 72 | 0.48 | 1.67 | 4.03 | 1.02 | 1.18 |
| -15 | (+ 5) | 377 | 95 | 110 | 78 | 0.50 | 2.15 | 4.83 | 1.22 | 1.42 |
| -10 | (+14) | 476 | 120 | 139 | 84 | 0.51 | 2.72 | 5.74 | 1.45 | 1.68 |
| -5 | (+23) | 596 | 150 | 175 | 89 | 0.53 | 3.42 | 6.79 | 1.71 | 1.99 |
| 0 | (+32) | 741 | 187 | 217 | 94 | 0.54 | 4.28 | 7.99 | 2.01 | 2.34 |
| +5 | (+41) | 915 | 230 | 268 | 98 | 0.56 | 5.32 | 9.37 | 2.36 | 2.75 |
| +10 | (+50) | 1122 | 283 | 329 | 102 | 0.57 | 6.58 | 10.96 | 2.76 | 3.21 |
| +15 | (+59) | 1367 | 345 | 401 | 106 | 0.59 | 8.07 | 12.80 | 3.22 | 3.75 |

| TEST CONDITIONS: @220V60Hz | | ASHRAE32 Static | | | (Condensing temperature 55°C (+131°F)) | | | | | |
|-------------------------------|-------|----------------------------|----------|-----|--|-------------------------------|-------------------------|---------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 51 | 13 | 15 | 47 | 0.41 | 0.28 | 1.19 | 0.30 | 0.35 |
| -30 | (-22) | 114 | 29 | 33 | 55 | 0.43 | 0.65 | 1.96 | 0.49 | 0.57 |
| -25 | (-13) | 178 | 45 | 52 | 63 | 0.45 | 1.02 | 2.68 | 0.68 | 0.79 |
| -20 | (- 4) | 250 | 63 | 73 | 71 | 0.47 | 1.42 | 3.40 | 0.86 | 1.00 |
| -15 | (+ 5) | 332 | 84 | 97 | 79 | 0.50 | 1.89 | 4.12 | 1.04 | 1.21 |
| -10 | (+14) | 429 | 108 | 126 | 87 | 0.52 | 2.45 | 4.89 | 1.23 | 1.43 |
| -5 | (+23) | 546 | 138 | 160 | 95 | 0.55 | 3.14 | 5.72 | 1.44 | 1.67 |
| 0 | (+32) | 687 | 173 | 201 | 103 | 0.58 | 3.97 | 6.64 | 1.67 | 1.94 |
| +5 | (+41) | 856 | 216 | 251 | 111 | 0.62 | 4.98 | 7.67 | 1.93 | 2.25 |
| +10 | (+50) | 1058 | 267 | 310 | 120 | 0.66 | 6.20 | 8.86 | 2.23 | 2.59 |
| +15 | (+59) | 1297 | 327 | 380 | 129 | 0.70 | 7.66 | 10.21 | 2.57 | 2.99 |

| TEST CONDITIONS: @220V60Hz | | ASHRAE32 Static | | | (Condensing temperature 65°C (+149°F)) | | | | | |
|-------------------------------|-------|----------------------------|----------|-----|--|-------------------------------|-------------------------|---------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 18 | 5 | 5 | 44 | 0.41 | 0.10 | 0.44 | 0.11 | 0.13 |
| -30 | (-22) | 76 | 19 | 22 | 52 | 0.43 | 0.43 | 1.36 | 0.34 | 0.40 |
| -25 | (-13) | 135 | 34 | 39 | 60 | 0.45 | 0.77 | 2.17 | 0.55 | 0.64 |
| -20 | (- 4) | 199 | 50 | 58 | 69 | 0.47 | 1.14 | 2.90 | 0.73 | 0.85 |
| -15 | (+ 5) | 274 | 69 | 80 | 78 | 0.50 | 1.56 | 3.58 | 0.90 | 1.05 |
| -10 | (+14) | 362 | 91 | 106 | 88 | 0.53 | 2.07 | 4.23 | 1.06 | 1.24 |
| -5 | (+23) | 470 | 118 | 138 | 98 | 0.57 | 2.70 | 4.87 | 1.23 | 1.43 |
| 0 | (+32) | 601 | 151 | 176 | 109 | 0.62 | 3.47 | 5.54 | 1.40 | 1.62 |
| +5 | (+41) | 760 | 191 | 223 | 121 | 0.67 | 4.42 | 6.26 | 1.58 | 1.84 |
| +10 | (+50) | 950 | 239 | 278 | 133 | 0.72 | 5.57 | 7.06 | 1.78 | 2.07 |
| +15 | (+59) | 1177 | 297 | 345 | 147 | 0.79 | 6.95 | 7.97 | 2.01 | 2.33 |

F - EXTERNAL CHARACTERISTICS

| | | | |
|-------------------------|-------------------|------|--------------------------|
| 1 Base plate | European Standard | | |
| 2 Tray holder | No | | |
| 3 Connectors | | | |
| 3.1 SUCTION | 6.5 +0.12/-0.08 | [mm] | (0.256" +0.005"/-0.003") |
| 3.1.1 Material | Copper | | |
| 3.1.2 Shape | Straight | | |
| 3.2 DISCHARGE | 4.94 +0.08/-0.08 | [mm] | (0.194" +0.003"/-0.003") |
| 3.2.1 Material | Copper | | |
| 3.2.2 Shape | Slanted | | |
| 3.3 PROCESS | 6.5 +0.12/-0.08 | [mm] | (0.256" +0.005"/-0.003") |
| 3.3.1 Material | Copper | | |
| 3.3.2 Shape | Slanted | | |
| 3.4 Oil cooler (Copper) | No | [mm] | |
| 3.5 Connector sealing | Rubber Plugs | | |